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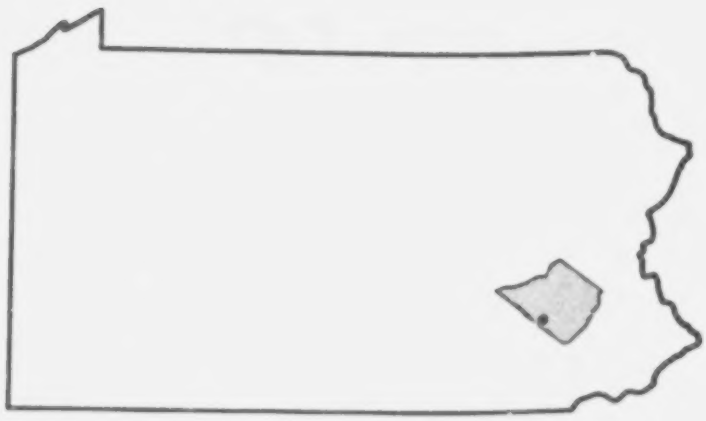
FLOOD INSURANCE STUDY

TOWNSHIP OF SOUTH HEIDELBERG, PENNSYLVANIA
BERKS COUNTY



MAY 17, 1990

Federal Emergency Management Agency

COMMUNITY NUMBER - 421107

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Flood Insurance Study Effective Date: May 17, 1990

Flood Insurance Study Revised:

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
	1.1 Purpose of Study	1
	1.2 Authority and Acknowledgments	1
	1.3 Coordination	1
2.0	AREA STUDIED	2
	2.1 Scope of Study	2
	2.2 Community Description	2
	2.3 Principal Flood Problems	4
	2.4 Flood Protection Measures	4
3.0	ENGINEERING METHODS	4
	3.1 Hydrologic Analyses	4
	3.2 Hydraulic Analyses	5
4.0	FLOODPLAIN MANAGEMENT APPLICATIONS	6
	4.1 Floodplain Boundaries	6
	4.2 Floodways	7
5.0	INSURANCE APPLICATIONS	9
6.0	FLOOD INSURANCE RATE MAP	11
7.0	OTHER STUDIES	11
8.0	LOCATION OF DATA	11
9.0	BIBLIOGRAPHY AND REFERENCES	11

TABLE OF CONTENTS - continued

Page

FIGURES

Figure 1 - Vicinity Map 3

Figure 2 - Floodway Schematic 9

TABLES

Table 1 - Summary of Discharges 5

Table 2 - Floodway Data 8

EXHIBITS

Exhibit 1 - Flood Profiles

Cacoosing Creek	Panels 01P-07P
Little Cacoosing Creek	Panels 08P-09P
Hospital Creek	Panel 10P
Manor Creek	Panels 11P-13P
Tributary to Spring Creek	Panel 14P

Exhibit 2 - Flood Insurance Rate Map and Street Index

Exhibit 3 - Elevation Reference Marks

FLOOD INSURANCE STUDY
TOWNSHIP OF SOUTH HEIDELBERG, BERKS COUNTY, PENNSYLVANIA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Township of South Heidelberg, Berks County, Pennsylvania, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the U. S. Geological Survey (USGS) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-85-E-1823, Project Order No. 8. This work was completed in October 1988.

1.3 Coordination

On November 14, 1984, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives of FEMA, the township, and the USGS (the study contractor) to determine the streams to be studied by detailed methods.

On June 8, 1989, a final CCO meeting was held with representatives of FEMA, the township, and the study contractor to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Township of South Heidelberg, Berks County, Pennsylvania. The area of study is shown on the Vicinity Map (Figure 1).

The streams studied by detailed methods are shown in the following tabulation.

Stream	Limits of Detailed Study
Cacoosing Creek	From the downstream corporate limits to a point approximately 3.4 miles upstream
Little Cacoosing Creek	From the downstream corporate limits to a point approximately 1.6 miles upstream
Hospital Creek	From the downstream corporate limits to a point approximately 0.4 mile upstream
Manor Creek	From the downstream corporate limits to a point approximately 1 mile upstream
Tributary to Spring Creek	From the downstream corporate limits to a point approximately 0.3 mile upstream

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through October 1993.

Cocalico Creek, an unnamed tributary, and the remaining portions of Cacossing Creek were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the Township of South Heidelberg.

2.2 Community Description

The Township of South Heidelberg is located in the southwestern portion of Berks County, in southeastern Pennsylvania, approximately 5 miles west of Reading. It is bordered by the Township of Heidelberg to the northwest, the Township of Lower Heidelberg and

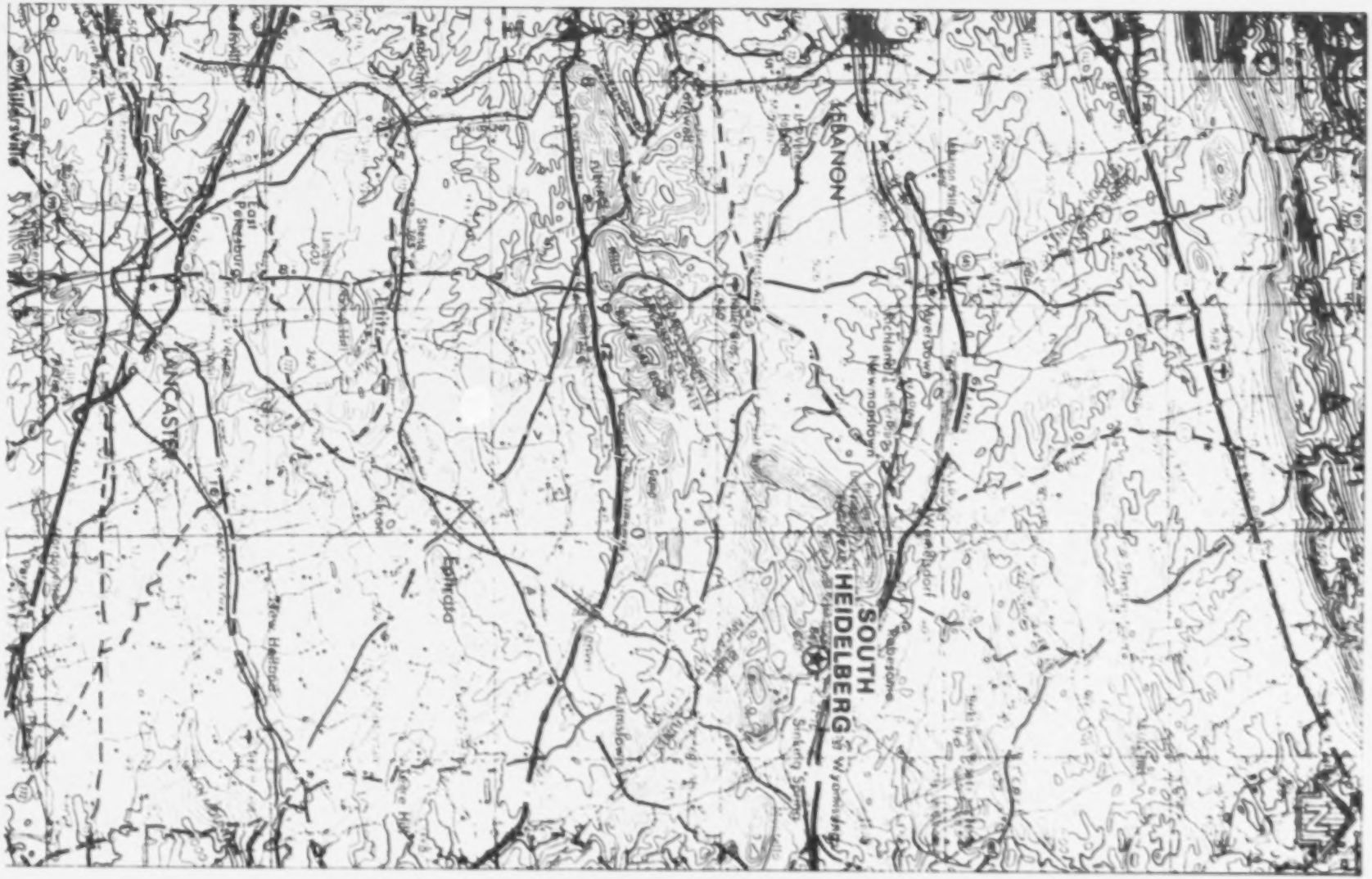


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA
(BERKS CO.)

APPROXIMATE SCALE

4 0 4 8 12 MILES

VICINITY MAP

the Borough of Wernersville to the northeast, the Borough of Sinking Spring to the east, the Township of Spring to the southeast, the Townships of West Cocalico and East Cocalico to the south, and the Township of Mill Creek to the southwest.

2.3 Principal Flood Problems

Major floods cause localized inundation of structures along Cacoosing Creek, Little Cacoosing Creek, Hospital Creek, Manor Run, Cocalico Creek, and several unnamed tributaries within the township.

2.4 Flood Protection Measures

No flood protection measures currently exist within the township to alleviate flooding.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. A flood event of a magnitude which is expected to be equaled or exceeded once on the average during any 100-year period (recurrence interval) has been selected as having special significance for floodplain management and for flood insurance rates. This event, commonly termed the 100-year flood, has a 1 percent chance of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

The flood-frequency discharge values for Cacoosing Creek were obtained from the Flood Insurance Study for the Township of Spring (Reference 1). These values were determined using a U. S. Army Corps of Engineers (COE) regional study (Reference 2). For the remaining streams studied by detailed methods, the flood-frequency discharge values were determined using regional regression equations developed in USGS Water-Resources Investigations 82-21 and the COE regional study (References 3 and 2).

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGE (cfs) 100-YEAR
CACOOSING CREEK		
At downstream corporate limits (U. S. Route 422)	7.42	2,100
Upstream of confluence with Wheatfield Road Tributary	3.26	1,320
LITTLE CACOOSING CREEK		
At downstream corporate limits (U. S. Route 422)	2.68	960
At Lincoln Drive (Legislative Route 06063)	1.64	660
At Bell Alto Road (Township Route 379)	0.65	320
HOSPITAL CREEK		
At downstream corporate limits (U. S. Route 422)	2.87	1,010
MANOR CREEK		
At downstream corporate limits (U. S. Route 422)	2.42	880
Upstream of CONRAIL bridge	1.78	700
TRIBUTARY TO SPRING CREEK		
At downstream corporate limits (U. S. Route 422)	0.87	400

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross sections were field surveyed and located at close intervals above and below bridges and culverts in order to compute the significant backwater effects of those structures. All bridges, dams, and culverts in the community were field surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Insurance Rate Map (Exhibit 2).

Water-surface elevations of floods of the selected recurrence intervals for Cacoosing Creek were obtained from the Flood Insurance Studies for the Township of Spring and the Borough of Sinking Spring (References 1 and 4). For the remaining streams studied by detailed methods, normal depths of flooding for the 100-year recurrence interval were estimated from the regional relationship between drainage area and flood depth prepared by the USGS (Reference 5). This relationship was developed by means of regional regression analyses of basin areas and 100-year within-channel depths observed at stream gages. Depths were adjusted on the basis of hydraulic calculations to account for increased depth due to backwater from hydraulic structures, such as bridges and culverts (References 6, 7, 8, 9, and 10). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Channel roughness factors (Manning's "n") used in the hydraulic computations were assigned on the basis of engineering judgment and field inspection of the floodplain areas. The channel "n" values for the streams studied by detailed methods ranged from 0.022 to 0.038, and the overbank "n" values ranged from 0.022 to 0.068.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100-year floodplain boundaries to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. For the streams studied in detail, the 100-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 20 feet (Reference 11).

For the streams studied by approximate methods, the boundaries of the 100-year floodplain were delineated using the Flood Hazard Boundary Map for the Township of South Heidelberg (Reference 12).

The 100-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodways are shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown. Portions of the floodway widths for Cacoosing Creek extend beyond the corporate limits. Floodway data for Cacoosing Creek were taken from the Flood Insurance Study for the Township of Spring (Reference 1).

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NAVD)			
Cacoosing Creek								
A	1,370	195/92	634	3.3	328.4	328.4	329.3	0.9
B	7,540	193/1002	642	3.3	366.7	366.7	367.6	0.9
C	10,240	128/642	267	4.9	386.5	386.5	386.6	0.1
D	13,470	262/1972	882	1.5	427.0	427.0	427.9	0.9
E	15,060	77/162	286	4.6	444.7	444.7	445.6	0.9
F	17,100	106/412	200	4.7	474.8	474.8	474.8	0.0

[1]Feet above corporate limits
[2]Width/width within corporate limits

TABLE 2

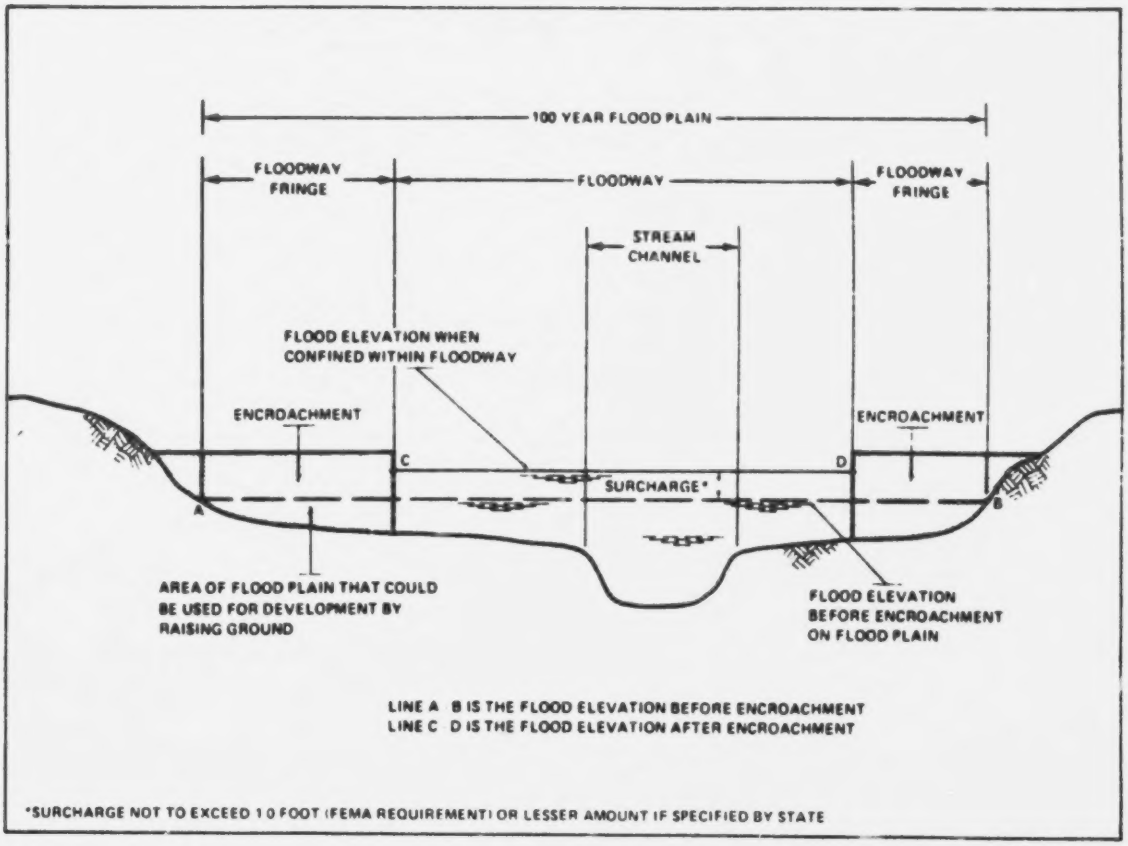
FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA

(BERKS CO.)

FLOODWAY DATA

CACOOSING CREEK


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

FLOODWAY SCHEMATIC

Figure 2

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100-year floodplain. The locations of selected cross sections used in the hydraulic analyses are shown where applicable.

7.0 OTHER STUDIES

Flood Insurance Studies have been prepared for the Townships of Spring and Lower Heidelberg and for the Borough of Sinking Spring (References 1, 13, and 4). The results of this study are in exact agreement with the results of those studies.

Flood Insurance Studies have been prepared for the Township of West Cocalico and the Borough of Wernersville (References 14 and 15). Discrepancies exist between this study and those studies because of the more up-to-date nature of this study.

Due to its more detailed nature, this study supersedes the Flood Hazard Boundary Map for the Township of South Heidelberg (Reference 12).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, Liberty Square Building (Second Floor), 105 South Seventh Street, Philadelphia, Pennsylvania 19106.

9.0 BIBLIOGRAPHY AND REFERENCES

1. Federal Emergency Management Agency, Flood Insurance Study, Township of Spring, Berks County, Pennsylvania, Washington, D. C., April 18, 1983.

2. U. S. Army Corps of Engineers, Hydrologic Engineering Center, Regional Frequency Study, Upper Delaware and Hudson River Basins, Davis, California, November 1974.

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8. U. S. Department of the Interior, Geological Survey, Techniques of Water-Resources Investigations, Measurement of Peak Discharge at Dams by Indirect Methods by Harry Hulsing, Washington, D. C., 1976.

9. U. S. Federal Highway Administration, Report FHWA/RD-86/108, Bridge Waterways Analysis Model/Research Report by J. O. Shearman, W. H. Kirby, V. R. Schneider, and H. N. Flippo, Jr., Washington, D. C., 1986.

10. National Technical Information Service, Bridge Waterways Analysis Model/User's Instructions by J. O. Shearman, W. H. Kirby, and V. R. Schneider, Springfield, Virginia, 1985.

11. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 Feet: Sinking Spring, Pennsylvania, 1955, Photorevised 1974.

12. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Township of South Heidelberg, Berks County, Pennsylvania, June 4, 1976.

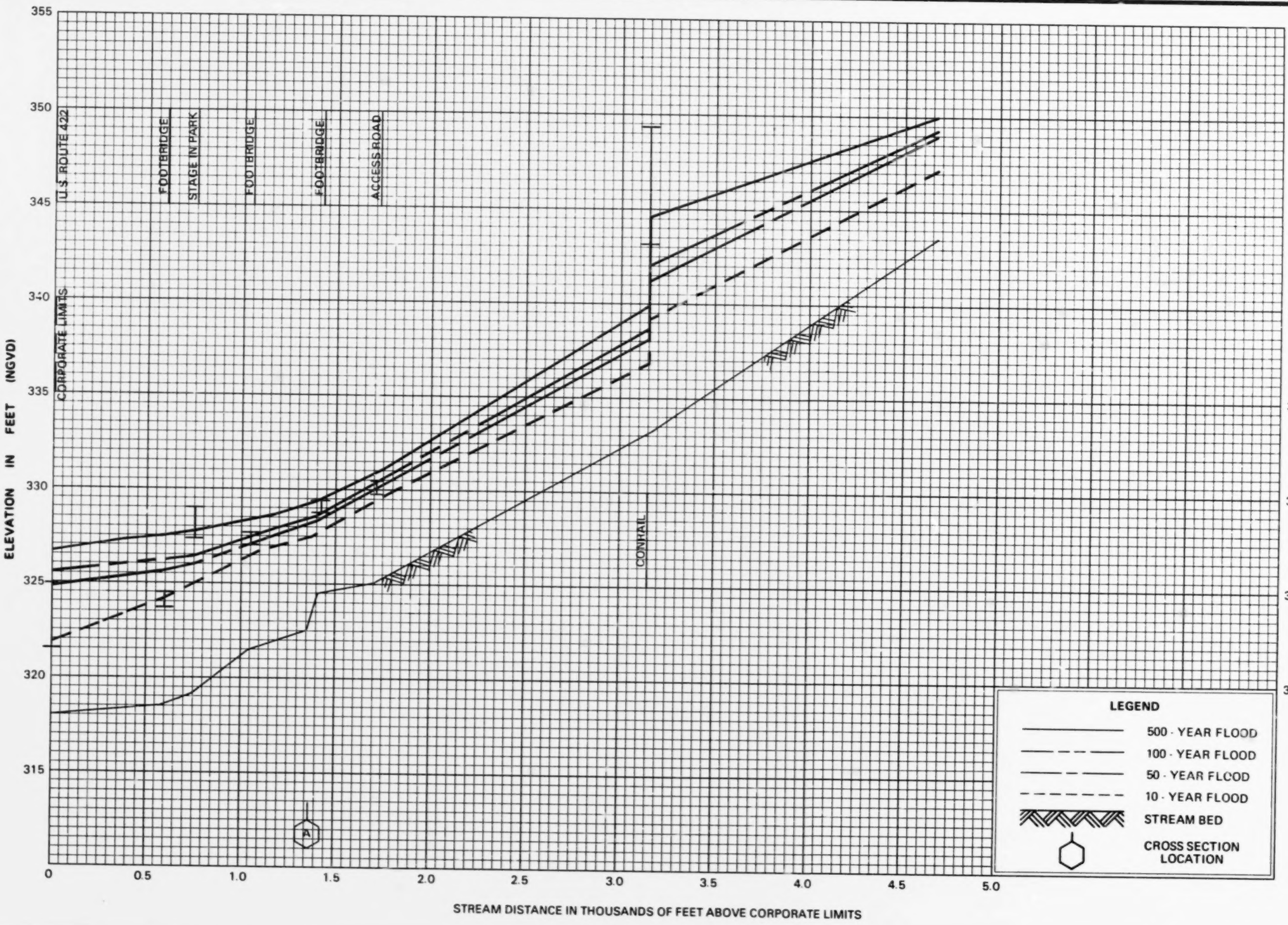
13. Federal Emergency Management Agency, Flood Insurance Study, Township of Lower Heidelberg, Berks County, Pennsylvania, Washington, D. C., August 16, 1982.

14. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Township of West Cocalico, Lancaster County, Pennsylvania, Washington, D. C., April 27, 1981.

15. Federal Emergency Management Agency, Flood Insurance Study, Borough of Wernersville, Berks County, Pennsylvania, Washington, D. C., August 2, 1982.

EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	Elevation (Feet NGVD)	Description of Location
RM 1	384.44	Chiseled square on top of southwest concrete curb at Hospital Creek culvert under U. S. Route 422.
RM 2	363.30	Chiseled square on top of southwest concrete curb at Manor Creek culvert under U. S. Route 422.
RM 3	405.38	Chiseled square on concrete curb at southwest end of Manor Creek culvert under Township Route 379 (Walters Road).
RM 4	355.89	PDH tablet on top of southwest wing wall of Legislative Route 06063 (Lincoln Drive) culvert at Little Cacoosing Creek.
RM 5	327.90	Chiseled square cut in top of north wall of east abutment of U. S. Route 422 bridge over Cacoosing Creek.
RM 6	346.82	USC&GS disk, stamped M-327, set in top of east abutment at southeast corner of CONRAIL bridge over Cacoosing Creek.
RM 7	354.74	Chiseled square cut in northeast corner of concrete bridge deck, at east abutment, of Township Route 368 (Montello Road) bridge over Cacoosing Creek.
RM 8	372.89	Chiseled square cut in top of north wing wall of west abutment of access road bridge over Cacoosing Creek.
RM 9	401.00	PDH disk in top of south abutment on downstream side of Wernersville Road bridge over Cacoosing Creek.
RM 10	432.46	Square painted on top of downstream end of north abutment of access road bridge over Cacoosing Creek.
RM 11	460.54	Chiseled square cut in top of north wall of west abutment of Legislative Route 06062 (Fritztown Road) bridge over Cacoosing Creek.
RM 12	487.87	Chiseled square cut in top of upstream concrete headwall of west abutment of Township Route 375 (Mail Route Road) bridge over Cacoosing Creek.



FLOOD PROFILES

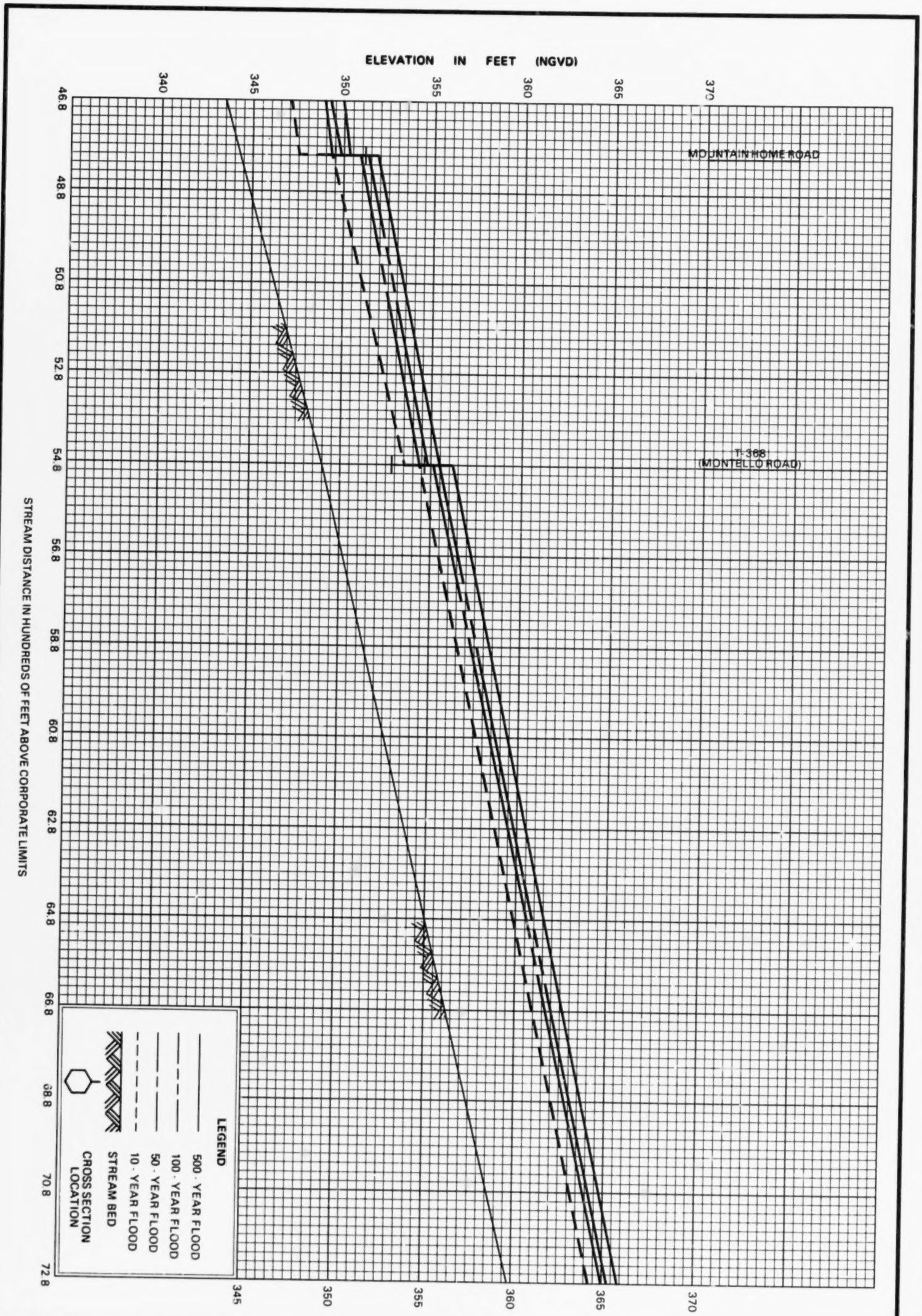
CACOOSING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA

(BERKS CO.)

01P



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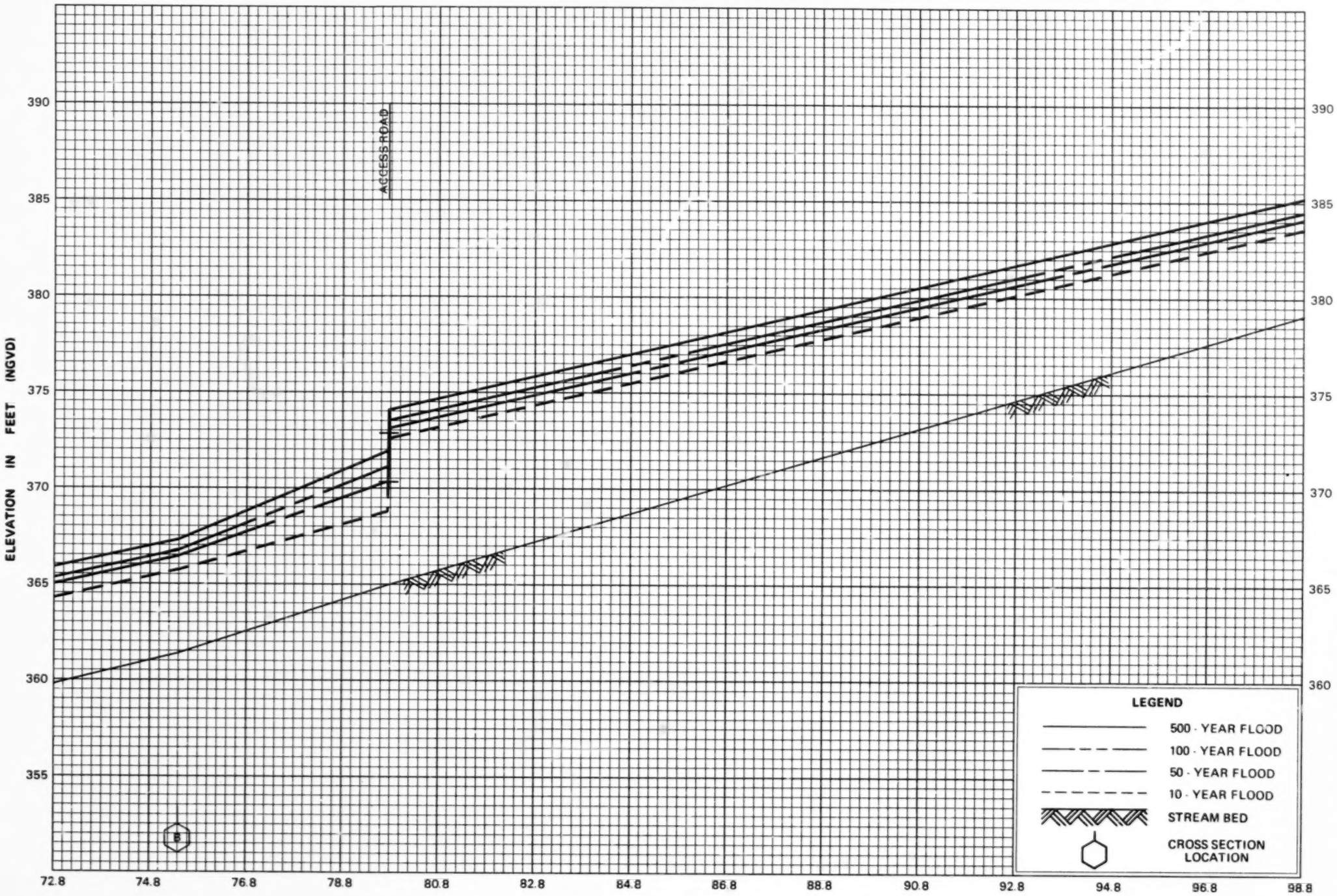


FLOOD PROFILES

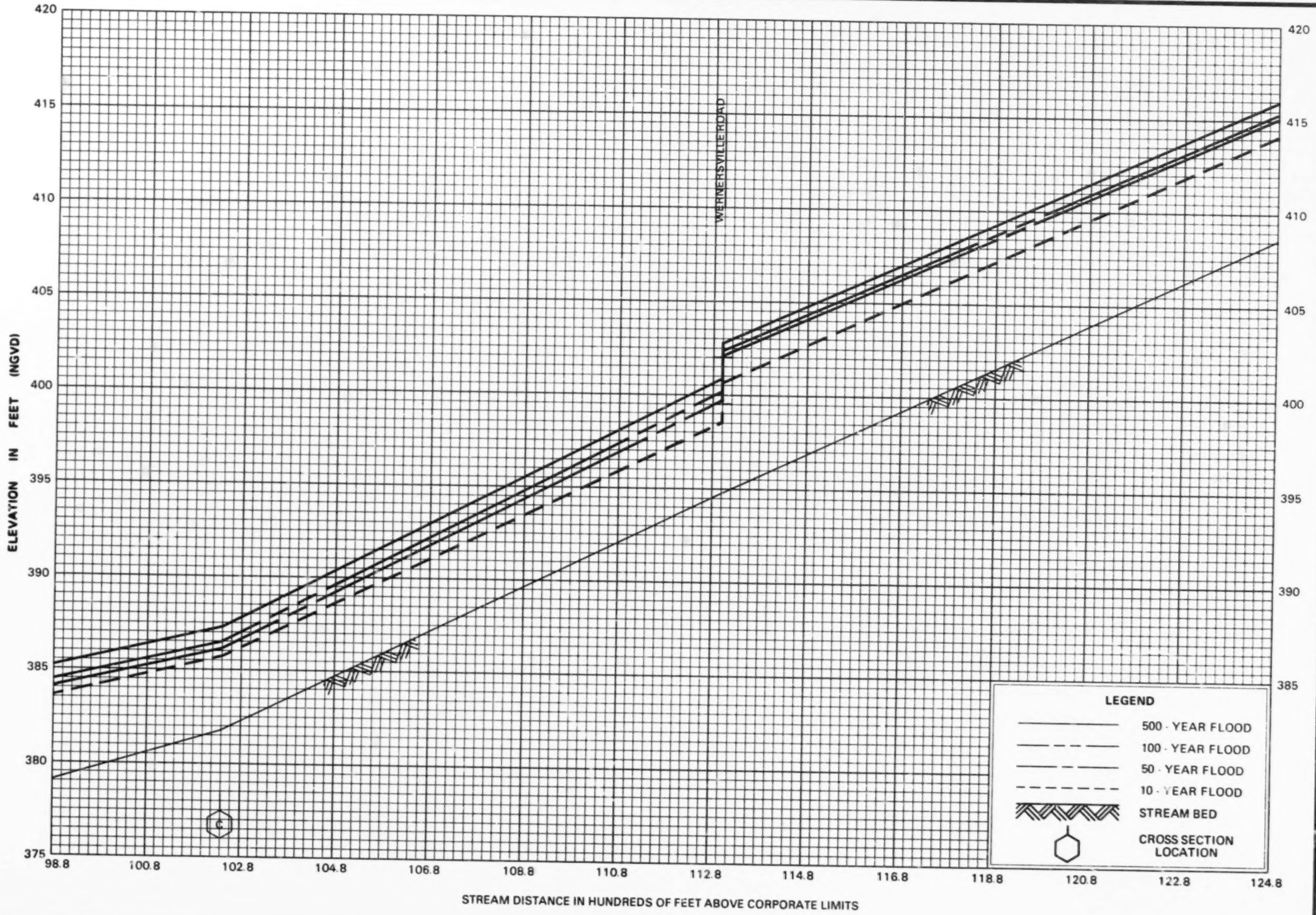
CACCOSING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA

(BERKS CO.)

03P



FLOOD PROFILES

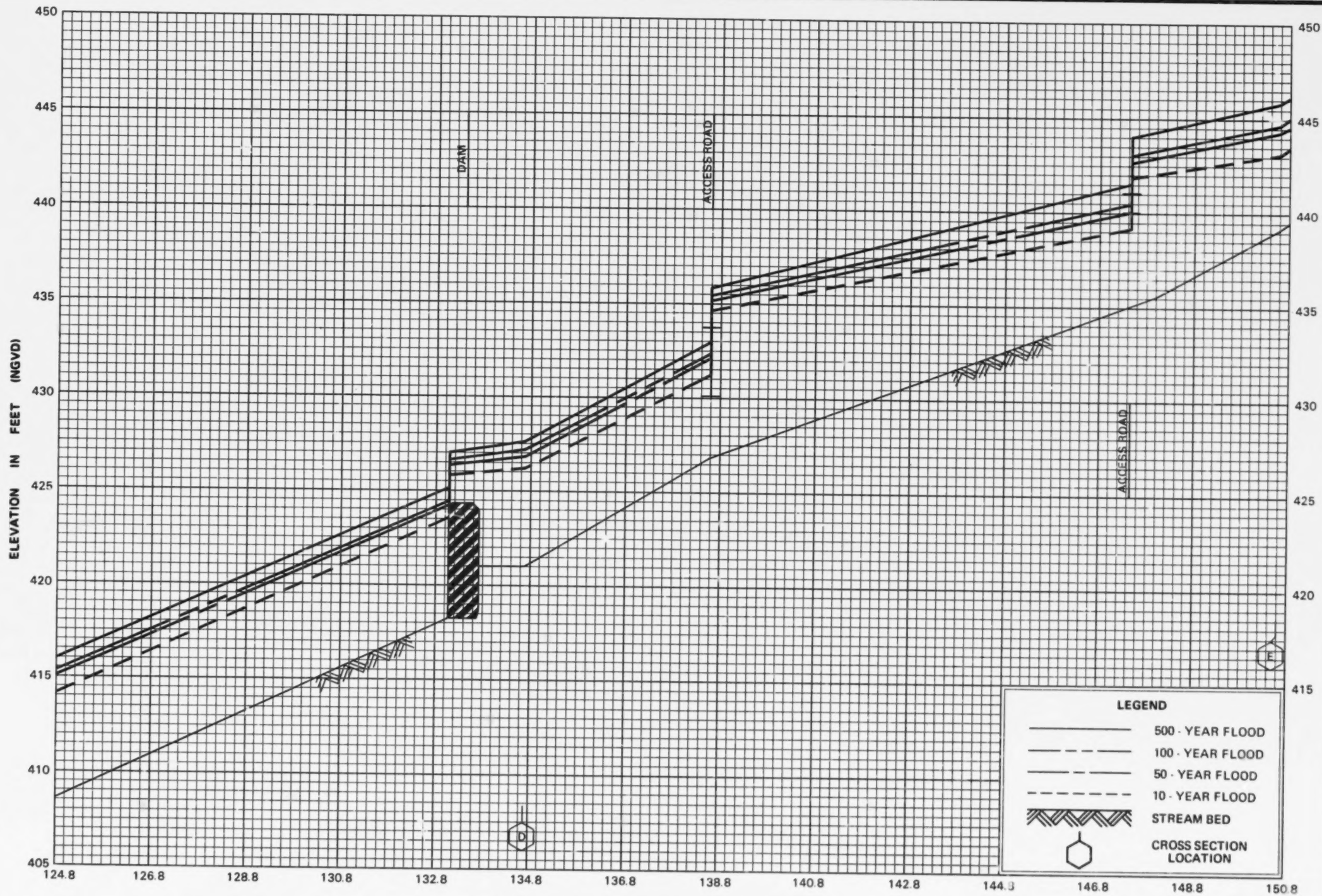
CACOOSING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA

(BERKS CO.)

04P



FLOOD PROFILES

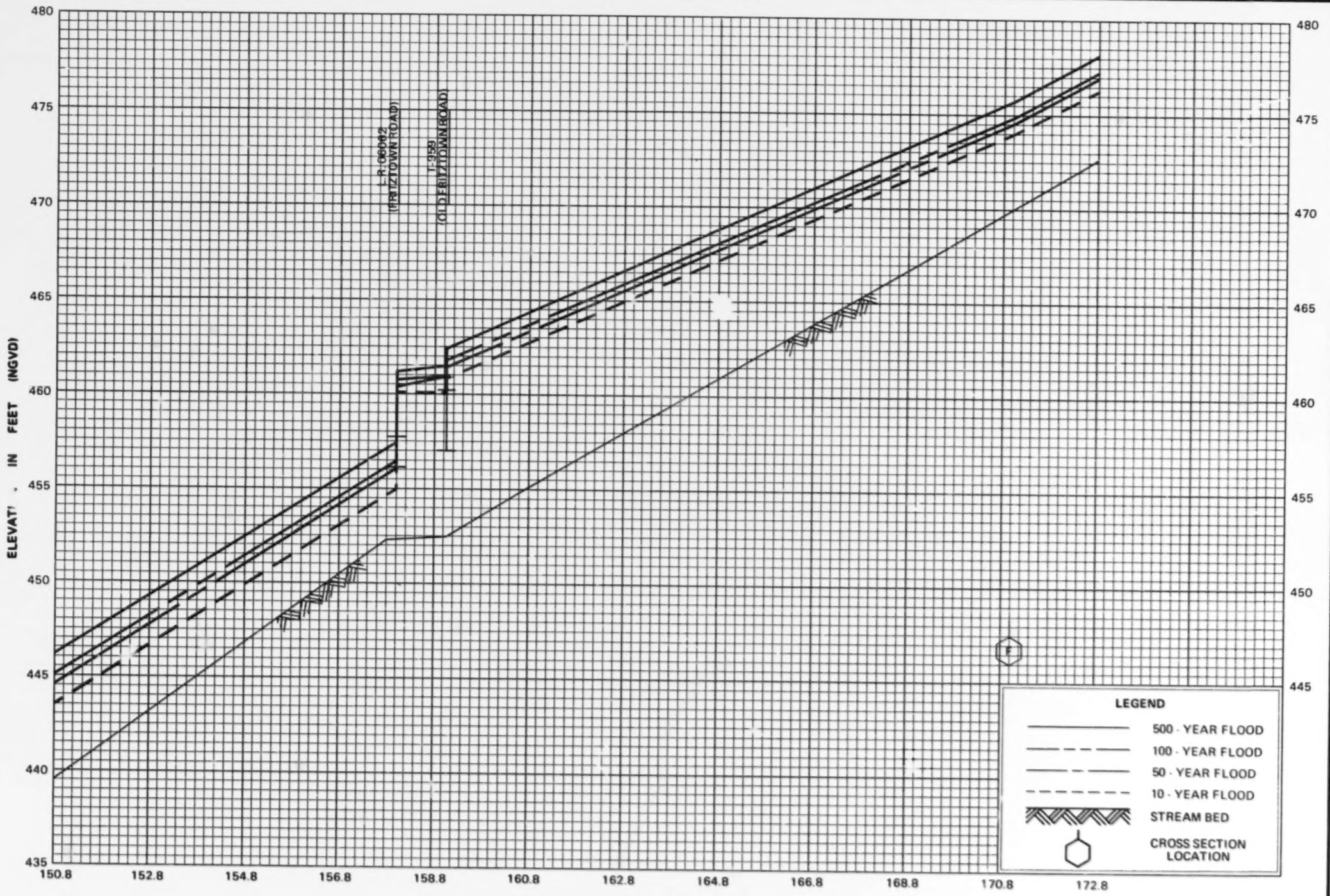
CACOOSING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA

(BERKS CO.)

05P



FLOOD PROFILES

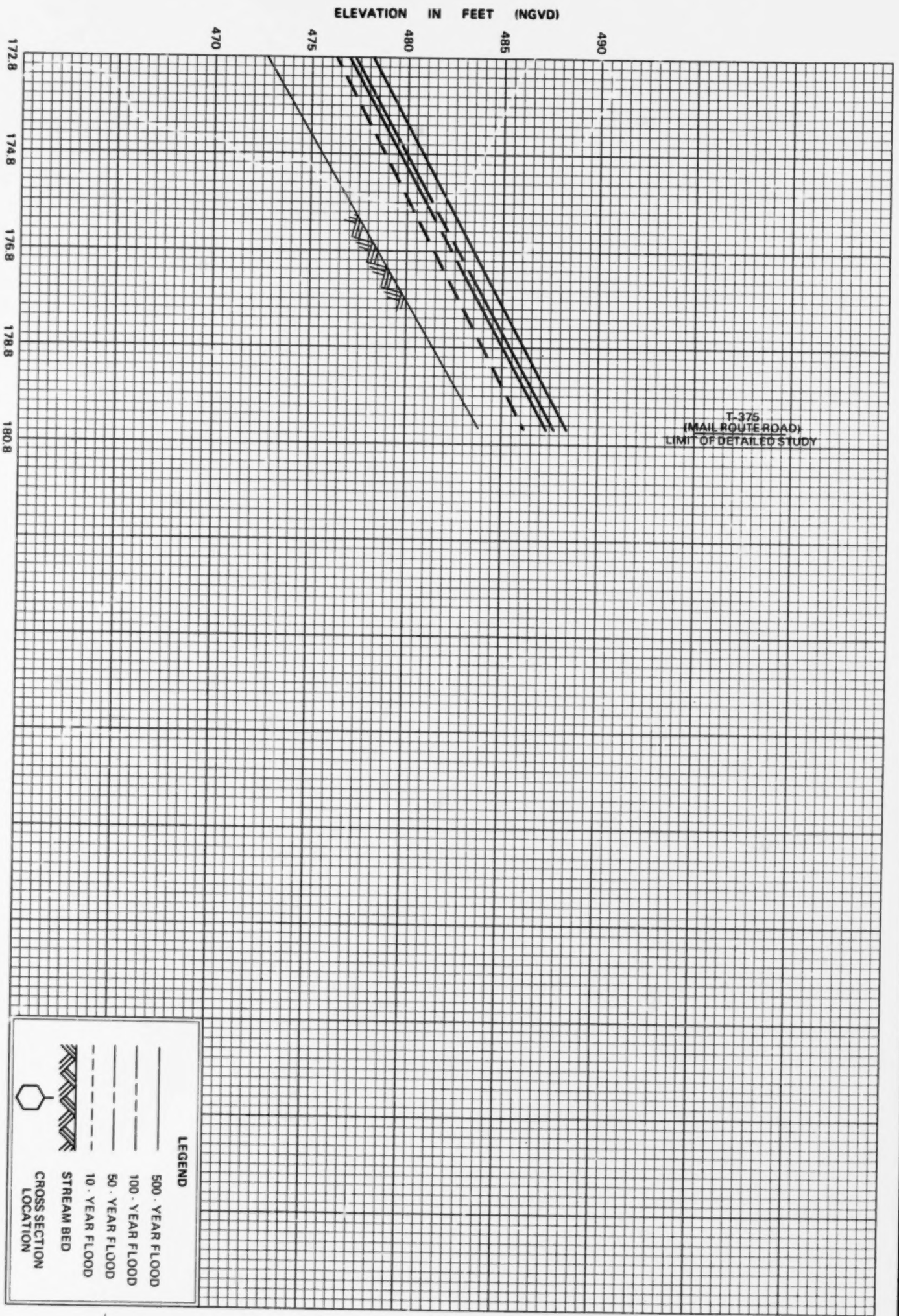
CACOOSING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA

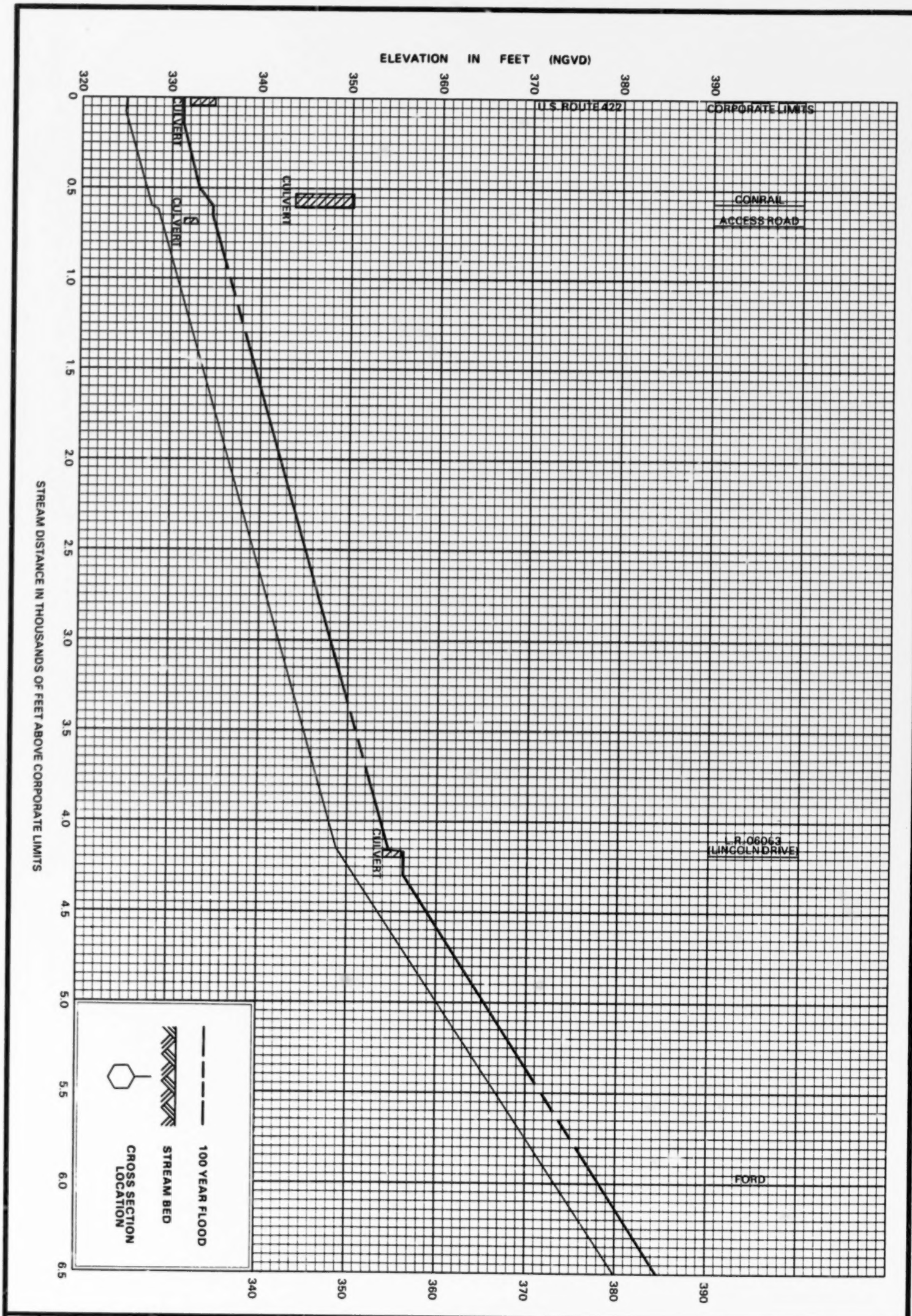
(BERKS CO.)

06P



20

07P	FEDERAL EMERGENCY MANAGEMENT AGENCY TOWNSHIP OF SOUTH HEIDELBERG, PA (BERKS CO.)	FLOOD PROFILES CACOOSING CREEK



08P

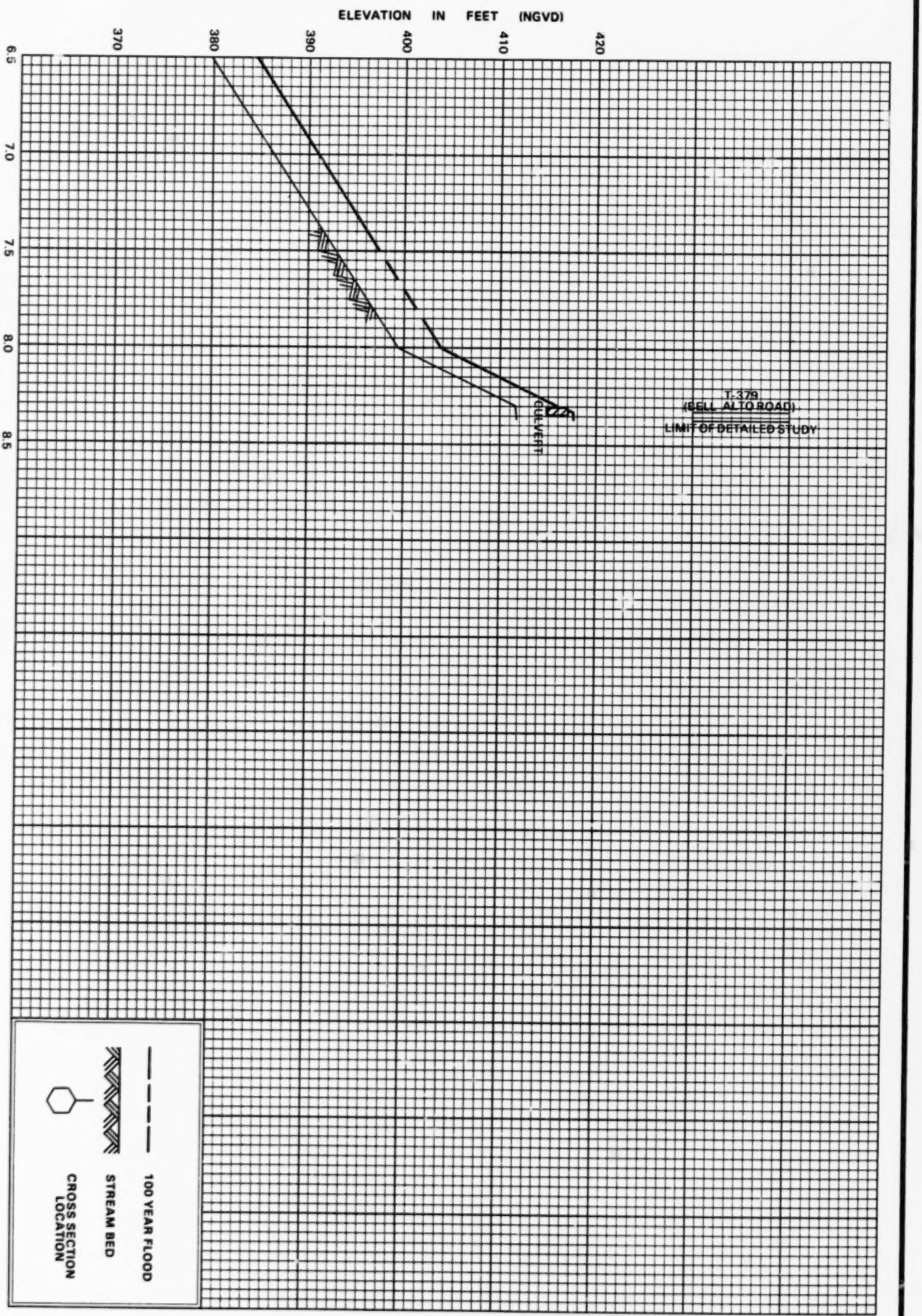
FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA
(BERKS CO.)

FLOOD PROFILES

LITTLE CACOOSING CREEK

21



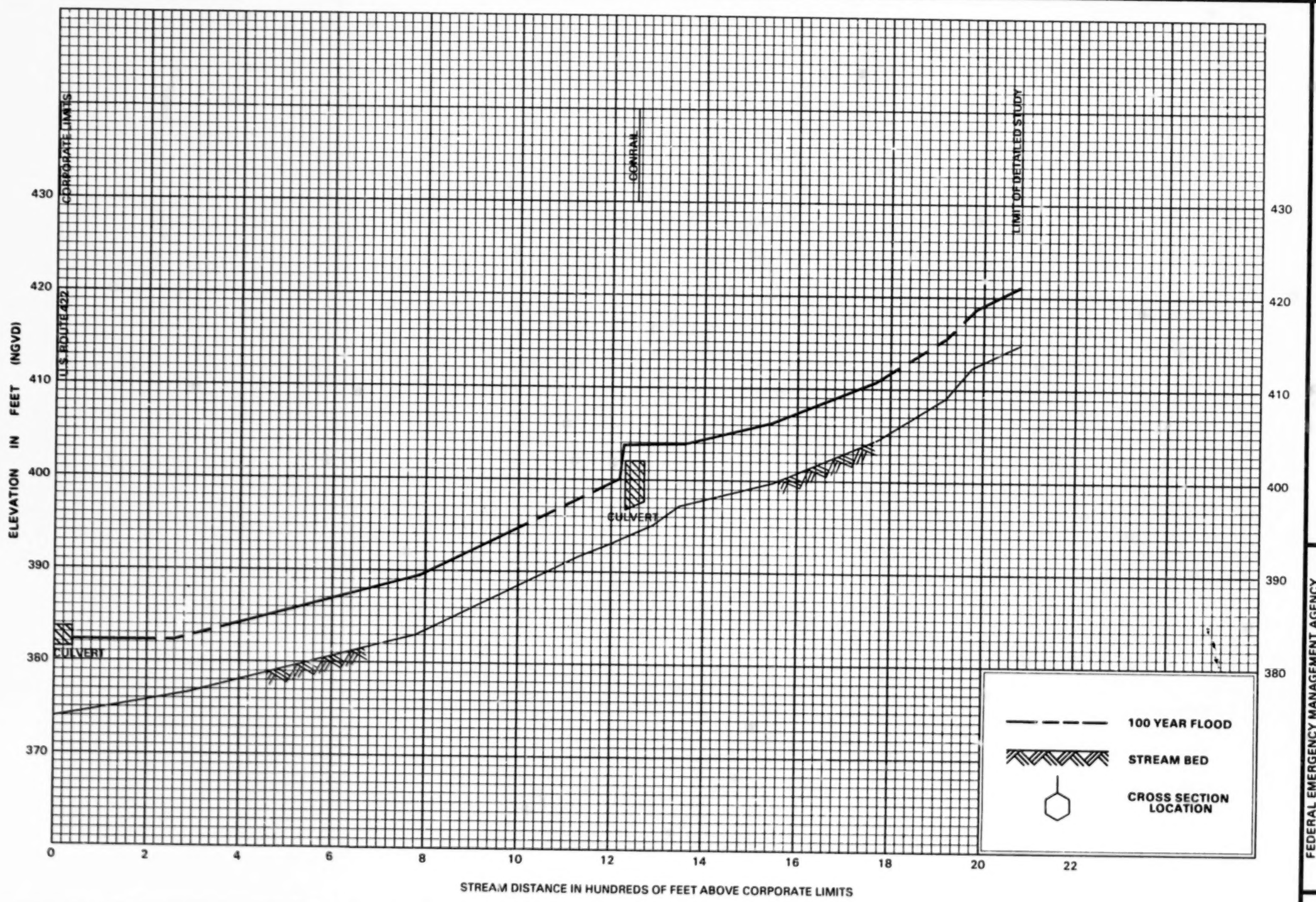
FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA
(BERKS CO.)

FLOOD PROFILES

LITTLE CACOOSING CREEK

09P



FLOOD PROFILES

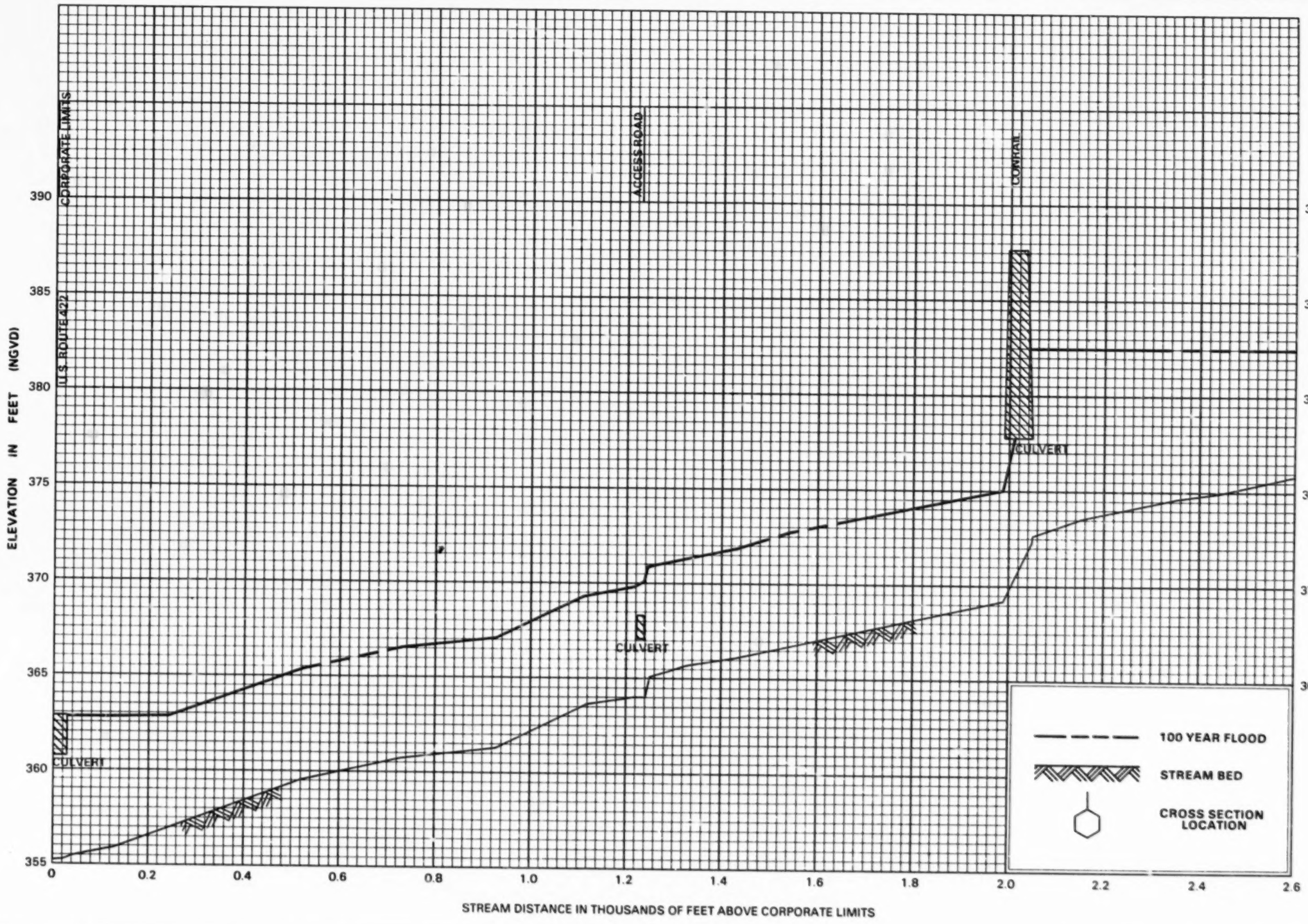
HOSPITAL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA

(BERKS CO.)

10P



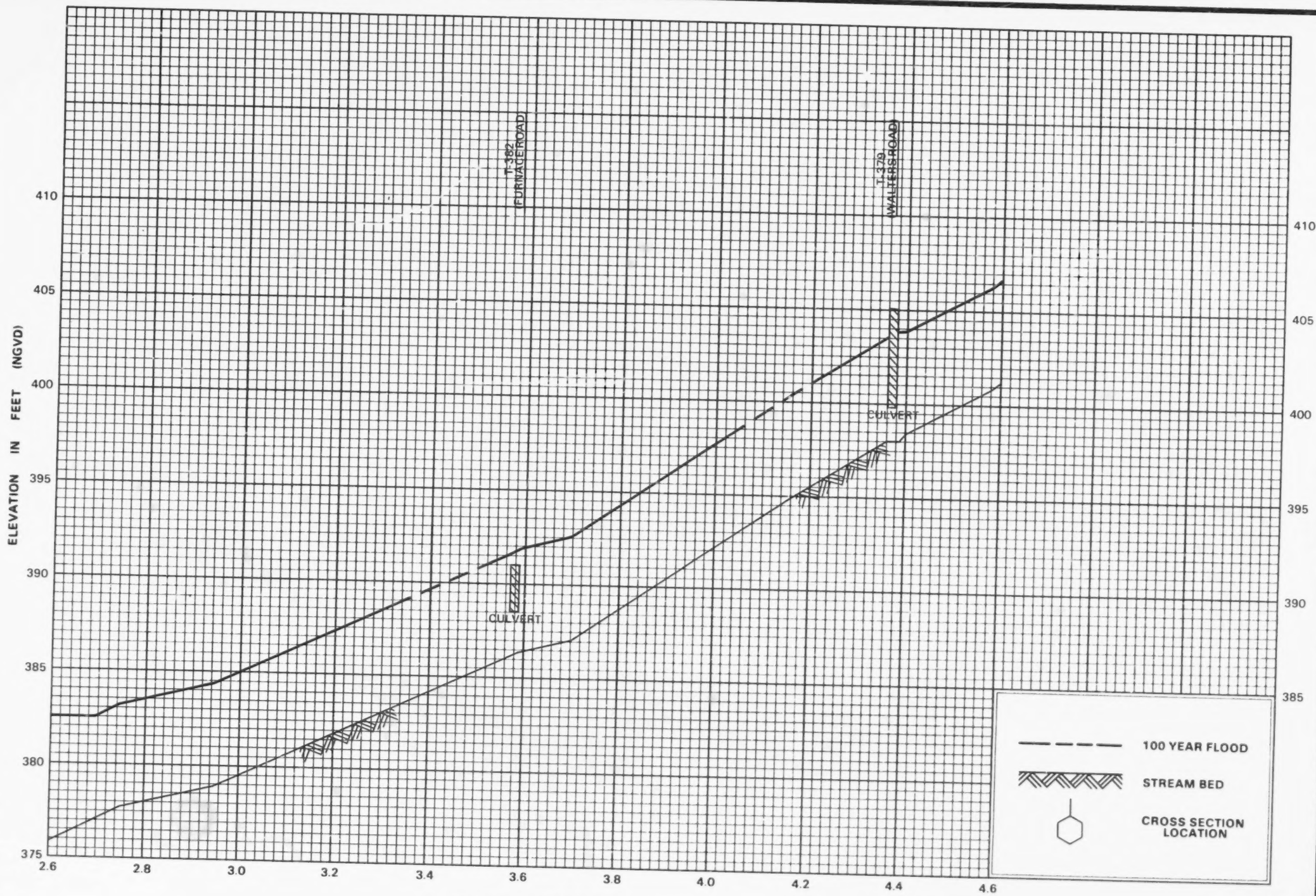
FLOOD PROFILES

MANOR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA
(BERKS CO.)

11P



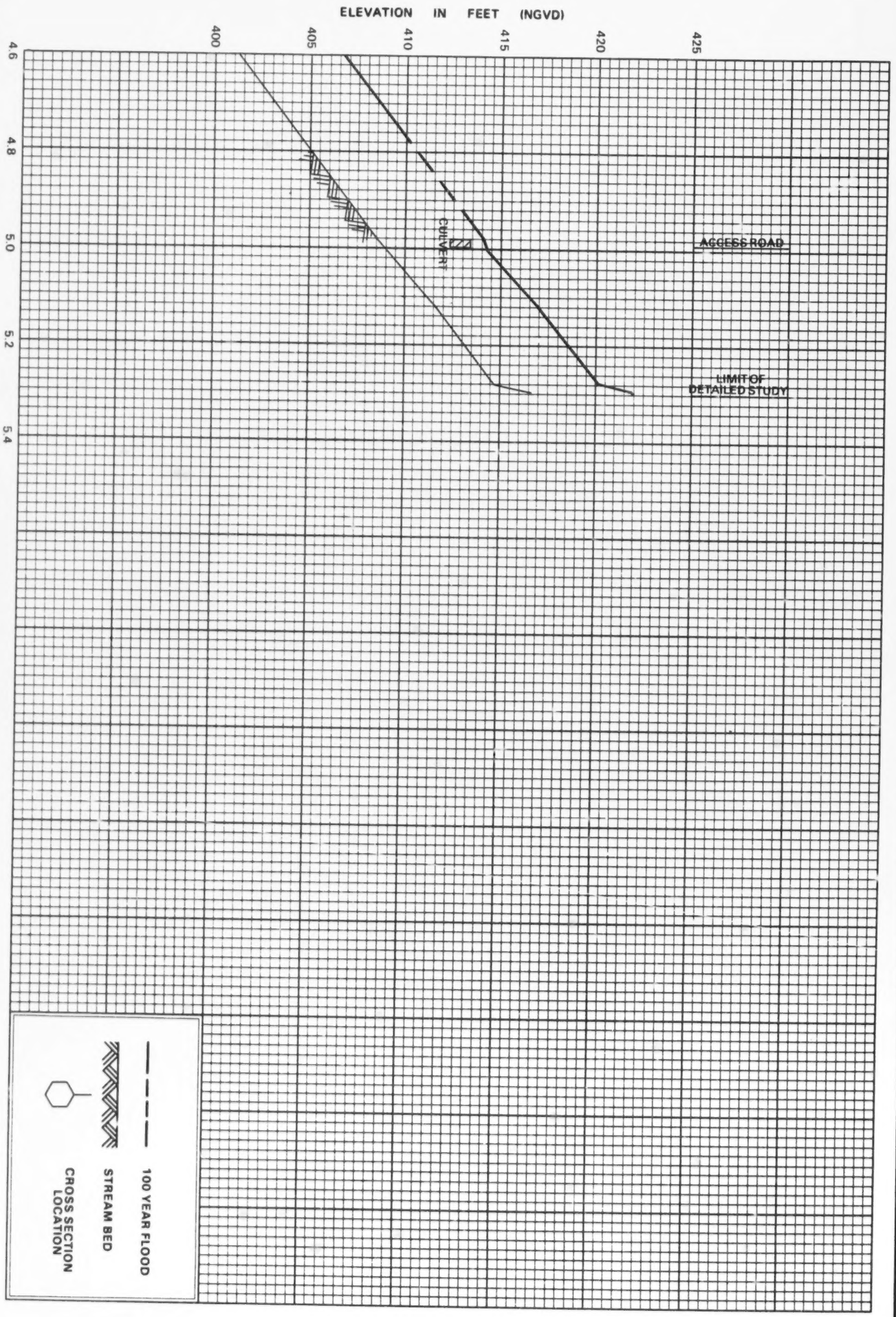
FLOOD PROFILES

MANOR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

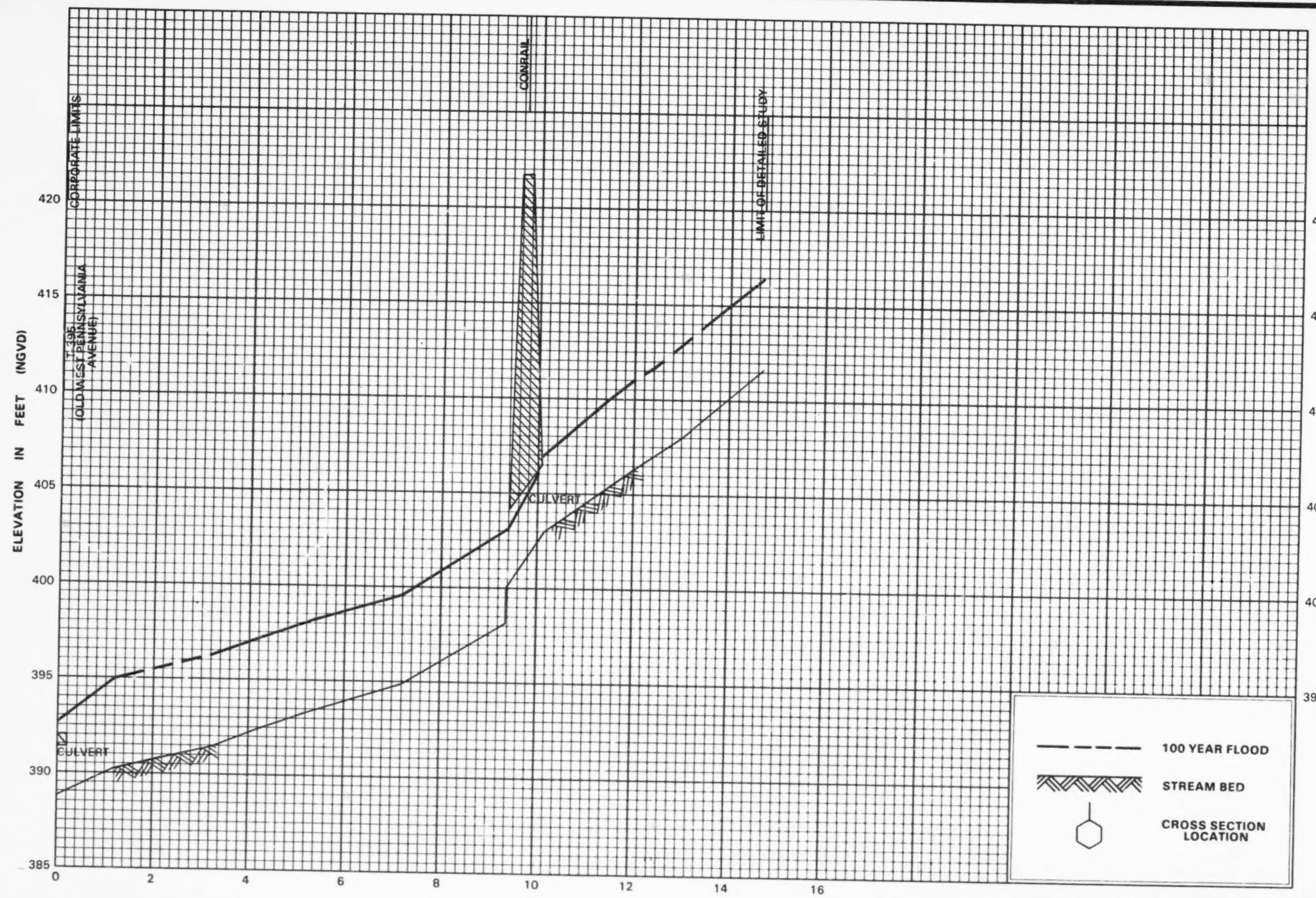
TOWNSHIP OF SOUTH HEIDELBERG, PA
(BERKS CO.)

12P



26

13P	FEDERAL EMERGENCY MANAGEMENT AGENCY TOWNSHIP OF SOUTH HEIDELBERG, PA (BERKS CO.)	FLOOD PROFILES MANOR CREEK



FLOOD PROFILES

TRIBUTARY TO SPRING CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF SOUTH HEIDELBERG, PA
(BERKS CO.)

14P